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Lighting of ceremonial lamp by Mr. Jasimuddin Mohammad, Head, Regional Programmes Group, GIDD, Commonwealth Secretariat, London.

Customised training in Mariculture for Maldivian officials at CMFRI

see page 13

भाकृअनुप ICAR

केंस मा अनु सं CMFRI

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
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Director Speaks

Dear Colleagues,

New Year Greetings to all of you.

This issue of 'Cadalmin' has come up with some interesting observations on mariculture. Silver pompano (*Trachinotus blochii*) is a promising fish in our pursuit for species suitable for aquaculture in the context of climate change. Recent study at Mandapam Regional Centre has shown that silver pompano larvae can withstand warm temperature and intense lighting. The Recirculation Aquaculture System (RAS) at Mandapam produced first spawning of Cobia (*Rachycentron canadum*). CMFRI is trying to strengthen the hatchery technology for different species which are suitable and congenial for mariculture. Private entrepreneurs are also coming up with grow out experiments in open sea cages. Various training programmes organized in mariculture will enable more individuals to opt the open sea cage technology. We have organized few international and national training programmes in mariculture during the last three months.

There are reports on changes noticed in the marine capture fishery along the coastal waters. Scientists from resource assessment division are preparing for the Marine Fisheries Census in 2015. New Year started with a series of pre-census workshops. I wish all colleagues and researchers a productive 2014 and look forward for better science to support the coastal fisher folk.

Namasthe

Dr. A. Gopalakrishnan
Director

About CMFRI

The Central Marine Fisheries Research Institute, Cochin, is a premier research Institute under the Indian Council of Agricultural Research, devoted to research and training in marine fisheries and mariculture.

CMFRI has three Regional Centres viz., Mandapam Camp, Visakhapatnam and Veraval and seven Research Centres located along the Indian coastline, catering to the marine fishery policy needs of all maritime states of the country.

Resilience of silver pompano *Trachinotus blochii* larvae to high temperature and light intensity

16 dph larvae of pompano with brown colour

The silver pompano *Trachinotus blochii* is one of the suitable candidate fish species for marine and brackish water aquaculture due to its fast growth rate, good meat quality and market demand. Realizing the potential of the species for farming, the Central Marine Fisheries Research Institute at its Mandapam Regional Centre has prioritized this species for captive breeding and seed production. The first success was obtained in 2011 and thereafter several seed production trials were conducted successfully. Demonstration of farming in cages and ponds were also conducted with promising results. Currently farming is progressing at several areas along the Indian coast and a heavy demand for seeds was evinced from the prospective farmers and entrepreneurs.

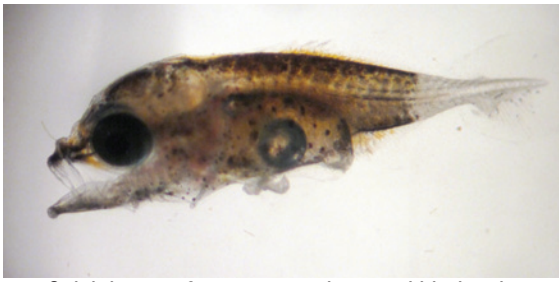
Silver pompano is also known for growing well in low salinities and good adaptability to different farming environments. Hence, the species was chosen for investigating its resilience for various environmental parameters from the larval phase onwards. Larviculture of pompano was carried out at Mandapam at a density of 5 larvae/litre in 1.5 tonne capacity FRP tanks. The larvae were subjected to two ranges of temperature and light intensity combinations in the larviculture tanks. One set of temperature and light intensity combination was 29.0 ± 0.2 °C and 2051 to 4620 lux (1st set) and in the other set the same were 31.0 ± 0.2 °C and 2212 to 7120 lux (2nd Set). All the protocols of larviculture were identically followed for both the sets.

The normal colour of pompano larvae from the 1st day post hatch (dph) is black. It was observed that in the 2nd set a conspicuous whitening of larvae due to loss of pigmentation took place on the 8th dph, whereas in the 1st set, the larval colouration continued to be black. The whitened larvae also showed normal movement and feeding behaviour. However, the growth was reduced when compared to the set 1. In the set No.1 the average larval length was 11mm, whereas in set No. 2 the same was 7.5mm on 15th dph. The whitening of larvae continued till the 14th dph and from 15th dph onwards the larvae started becoming brownish. Metamorphosis of these larvae started from the 22nd dph and completed by 25th dph, whereas metamorphosis in the set No.1, started from 18th dph and completed on 21st dph. At metamorphosis the colour of the fingerlings in both the sets was silvery.

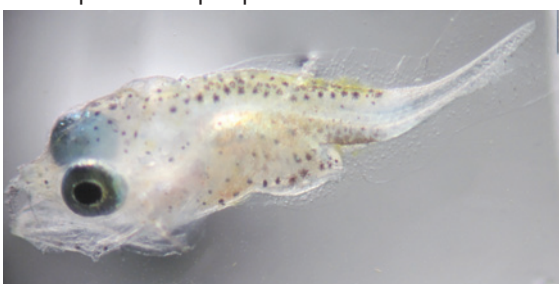
It is evident that the whitening of the larvae in response to high temperature and light intensity is an adaptation to withstand the unfavourable environmental parameters. The growth rate was also reduced during the stressed phase. It is evident that the larvae had resilience to overcome the adverse environmental conditions by reducing the growth rate and extending the metamorphosis period. The resilience to adverse environmental parameters in the larval stage itself is very much advantageous for selecting the species as a climate resilient one in the anticipated scenario of climate change. It is felt that silver pompano will prove to be a suitable species for marine and brackish water aquaculture with its capacity to adapt in the changed climatic conditions forecasted due to global warming.

The work has been carried out under the NICRA project. The result of the study is of great significance as it is expected to fulfil one of the major objectives in NICRA project of identifying a climate resilient species suitable for aquaculture in the context of climate change.

Reported by G. Gopakumar, A.K. Abdul Nazar, R. Jayakumar, G. Tamilmani, M. Sakthivel, Amir Kumar Samal, S. Sirajudeen and R.Thiagu, Mandapam RC and P. U. Zacharia, CMFRI, Cochin



8 dph larvae of pompano with normal black colour



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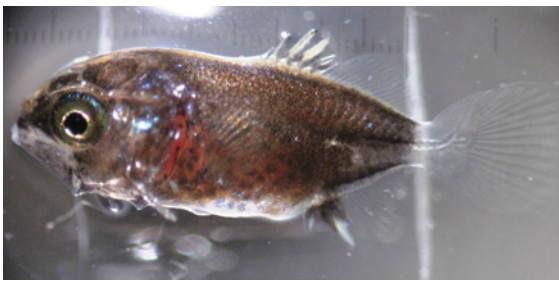
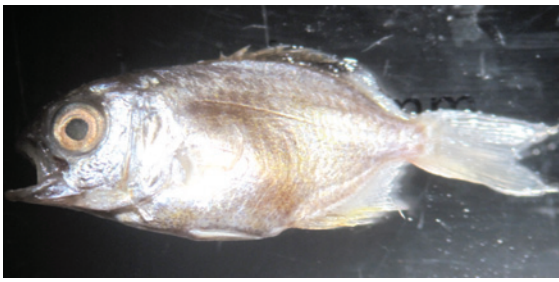
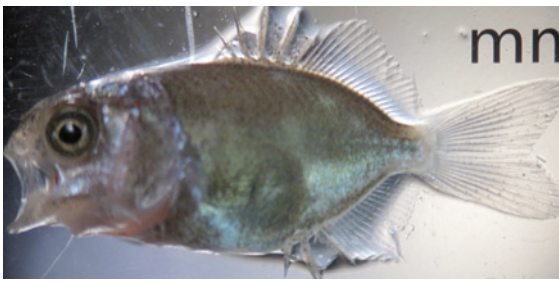


16 dph larvae of pompano with normal black colour

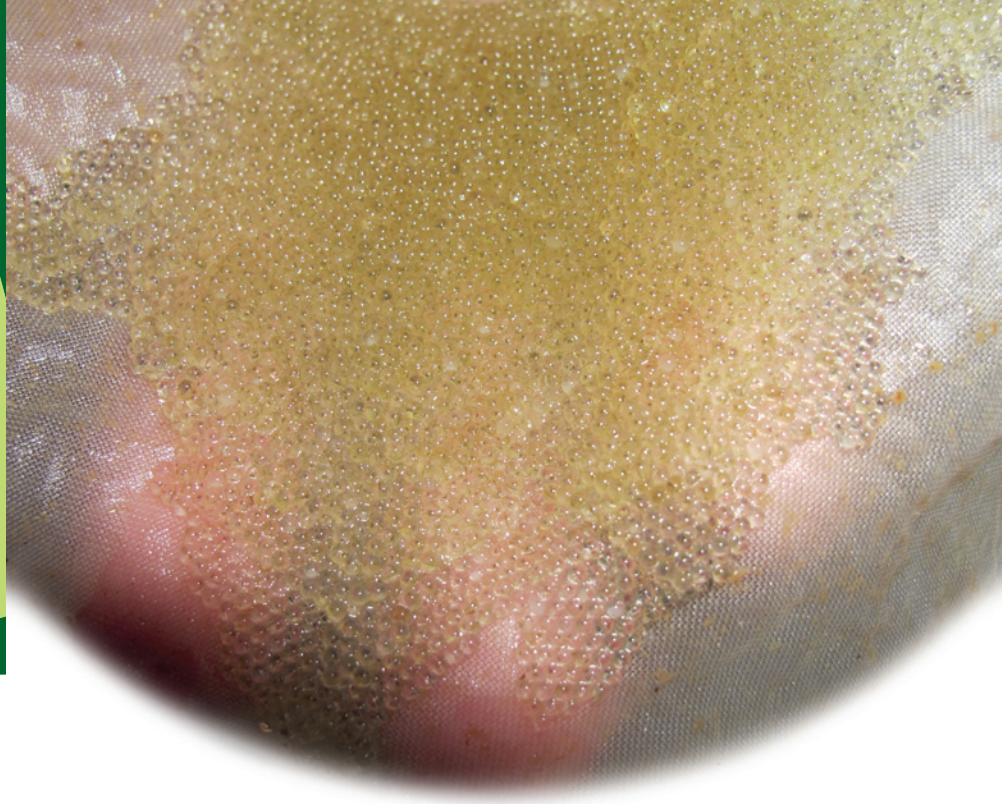


Metamorphosed pompano at 18 dph



Metamorphosed pompano at 22 dph

First successful spawning of cobia through thermal regulation in RAS facility at Mandapam RC



Fertilized eggs of cobia

It is well established that fishes being poikilothermic, water temperature is vital in getting successful spawning in captivity. At Mandapam Regional Centre of CMFRI successful spawning of cobia is continuously achieved from 2010. However, when the water temperature declined below optimal level in the spawning tank, successful spawning could not be obtained. With the onset of winter from November, the sea water temperature gradually falls below the optimal level and is not suitable for spawning of cobia. This has been a major bottleneck in the continuous breeding and seed production of cobia. This constraint is now overcome by thermal regulation of spawning in the Recirculation Aquaculture System (RAS). The first successful off season spawning of cobia through thermal regulation has been achieved in the RAS on 02-12-2013. Breeding experiment was conducted in the RAS through thermal regulation by installing titanium water heaters. During this season the temperature in source seawater was 25.1 to 26.0°C and it was raised in the RAS to 29.7 to 30.3 °C, by titanium heaters. The cobia brooders were healthy and brood stock development was continued in the RAS by regulating the temperature. Intra ovarian cannulation biopsy revealed the maturation of ova in the altered temperature. The female cobia was weighing 9.29 kg and males were 9.89 kg & 10.34 kg. Hormonal induction with hCG was done on 30th November 2013 and successful spawning was achieved on 2nd December 2013. The fertilized cobia eggs were collected and stocked in the incubation tanks for hatching. It is felt that the present success is a major breakthrough which can pave the way for the successful spawning and seed production of cobia all through the year.

Titanium heater in the Recirculation System

Collection of cobia eggs from RAS

(Reported by G.Gopakumar, A.K.Abdul Nazar, R.Jayakumar, G.Tamilmani, M.Sakthivel & Johnson, B. Mandapam Regional Centre)

Transportation of cobia and pompano fingerlings

A total of 42,800 fingerlings of silver pompano and 2,200 fingerlings of cobia were supplied to entrepreneur / fish farmer during the period October to December 2013 to different parts of the country.

Dr. B. Meenakumari, DDG (Fy), ICAR handing over the seeds to Gujarat entrepreneur

Adoption of sea cage farming technology developed by CMFRI

Rectangular sea cages established by farmer

First fully owned private sea cage farm in the northwest coast

Yet again the Satpati, a coastal village in north Maharashtra becomes first in fisheries development in India. With Mr. Anand M. Tare of this village initiating the farming of lobster in his fully owned sea cage farm off Satpati, it became the village to own the first ever private commercial sea cage farm in the north west coast of India.

The successful farming of lobsters in the cages by CMFRI RC Veraval since 2011-12 had attracted the attention of many prospective fishermen / farmers in the region to seacage farming especially farming of lobster in sea cages and one such person was Mr. Anand Tare. He started the farming with rectangular cages made of locally available materials like casuarina pole, iron rods and fishing nets etc. in a fully exposed sea area having depth of nearly 3 m. Three such modules were made and stocked with lobster juveniles during October, 2013. Following some hitches in farm maintenance including mortality in the cages, he made a visit to the RC and expressed his desire of knowing more about the technology in order to expand the farming activities at Satpati and requested for technical support of CMFRI. Thus, he was imparted with knowhow on the sea cage farming with hands on training on various aspects of the technology at Veraval. Problems in his farm were found to be due to inadequacy of the site and faulty design of cages.

After having trained at Veraval Centre of CMFRI, Shri Anand got fabricated two numbers of 6 m diameter circular cages made of 1 inch GI pipe and coated with the FRP following the protocol developed by CMFRI for lobster farming and deployed in an area identified suitable for lobster farming. The crop of lobster maintained in the rectangular cages has been transferred to the circular cages and the farming is progressing well without any problems now. The scientists of the Veraval RC are in constant touch with the farmer and strive to bring a grand success in his endeavour as success stories of this kind would motivate more such entrepreneurs in the region and help the technology developed by the Institute reach to more people along the coast.

6m circular GI cage for lobster farming

Circular cage being launched

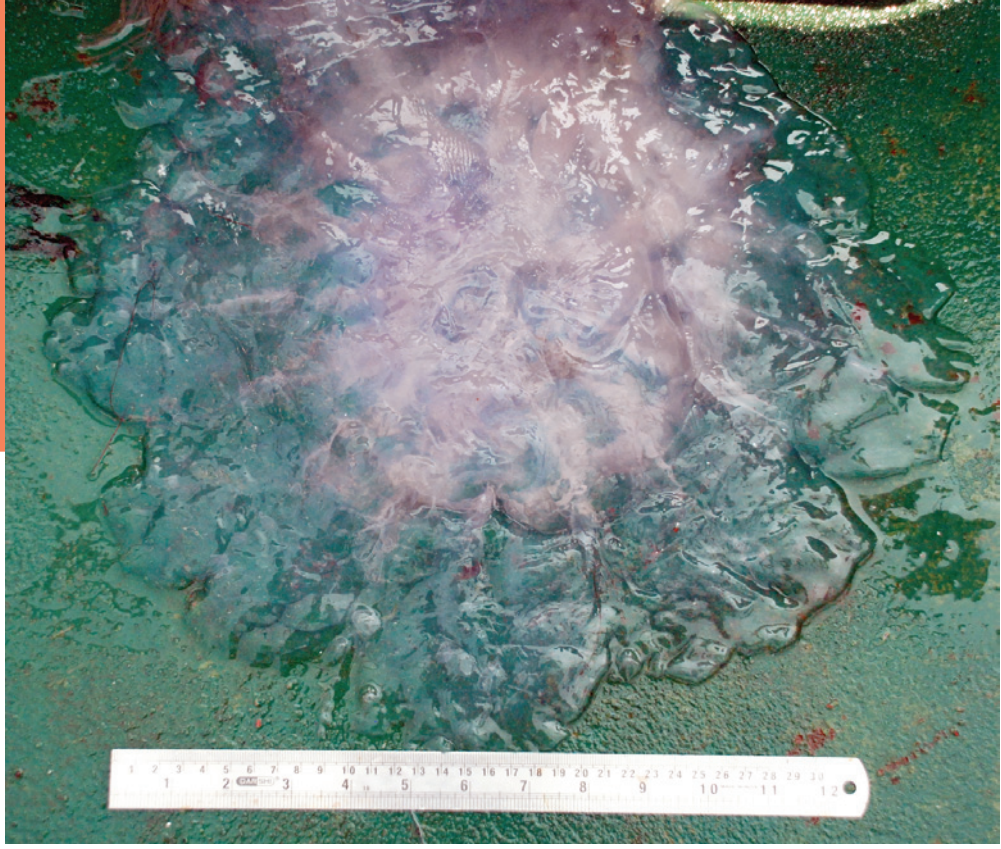
(Reported by K. Mohammed Koya, Sreenath K.R and H.M.Bhint, Veraval Regional Centre)

Wide-spread adoption of open sea cage culture technology in Karnataka, Goa and Maharashtra

Under the technical consultancy of Karwar RC, open sea cage farming has been initiated by the fishermen self help groups of Karnataka, Goa and Maharashtra. In Karnataka 35 cages have been installed at Karwar (30 cages) and Kumta (5 cages) for rearing Asian seabass and cobia. In Goa, 50 cages have been installed at Talpona (25 cages) and Polem (25 cages) for culturing cobia. In Maharashtra, 24 cages have been installed for rearing Asian seabass at Ratnagiri.

Increasing number of jellyfish *Cyanea* sp. along the Kerala coast - Needs alertness

Jellyfishes play an important role in marine food webs, serving as food for many marine animals especially sea turtles. It also predates on several groups of marine animals. In some countries, humans consume particular species of jellyfishes as delicacy food. However, many jellyfishes are venomous in nature. During the eight regular cruises onboard FRV *Silver Pompano* in December 2013, the jellyfish *Cyanea* sp. was observed in almost all hauls. About 2 to 12 specimens were caught with 21 to 100 cm bell diameter. The *Cyanea* sp. is voracious carnivore and mainly feed on small fishes, which can result in reduction of fish catches. Worldwide it has been reported that *Cyanea* sp. can split and ruin fishing nets, prey on and kill juvenile of fish, crabs and mollusks and produce toxins that are poisonous to people and marine animals.



Jellyfish *Cyanea* sp.

In 1945, the species was reported to occur in Kerala coast from November to December. However, in recent years these are reported to occur from August onwards. Globally, jellyfish numbers are increasing in response to eutrophication, overfishing, and climate change. Continuous year round monitoring of jellyfish is initiated by the Fishery Environment and Management Division of CMFRI to understand the resource and its input in fisheries.

(Prepared by FEM Division, Kochi)

Landing of rare porcupine ray at Pamban, Gulf of Mannar

On 18th December, 2013 a single individual of rare porcupine ray *Urogymnus asperrimus* (Bloch & Schneider, 1801) weighing 42 kg with a disc width of 87cm has been landed by a single day trawl at Pamban, in Gulf of Mannar Coast. The porcupine ray is the only member of this genus and occurs in tropical inshore waters of Eastern Atlantic and the Indo-west and Central Pacific. Earlier, this species has been recorded from east coast of India alone and recent record from Chettuva in Thrissur district of Kerala coast indicates its expanded distribution range along Indian coast. The porcupine ray has an oval-shaped disc that is covered with plate-like tentacles and sharp thorns. The tail lacks stinging spines and skin folds. The *Urogymnus asperrimus* is protected under the revised 2001 schedule I listing of Indian Wild life Protection Act. However, way back in 1944, P. I. Chacko in his report on the "Occurrence of a new variety of the skate, *Urogymnus asperrimus*, around Krusadai Island, Gulf of Mannar" observed the unique difference of Porcupine ray of Pamban coast. The meeting point of pectoral fin in front of snout is not round in outline as in *U. asperrimus*, hence he named it a variety of *U. asperrimus var. krusadiensis*. The present specimen was also having such an outline in front of the snout warrants further molecular works to establish its species validity.

Porcupine ray *(Urogymnus asperrimus)*

(Reported by: R.Saravanan, N. Ramamoorthy and K. Shanmuganathan, Mandapam RC)

Rare landing of small eye sting ray at Veraval fishing harbour

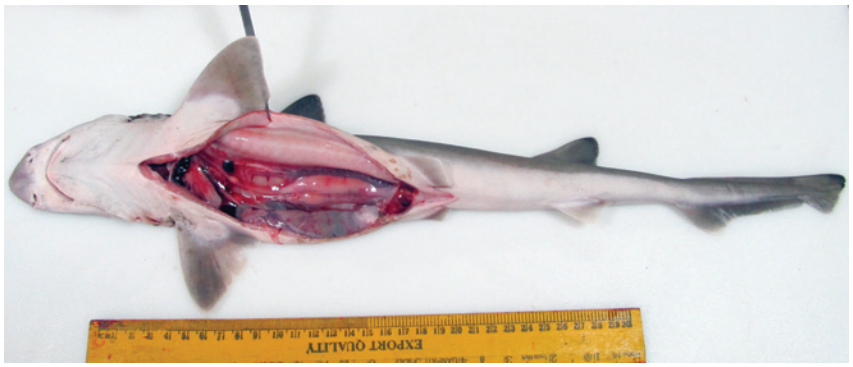
On 29th November, 2013 two large specimens (male) of small eye sting ray, *Dasyatis microps* (Annadale, 1908) were landed at Veraval fishing harbour by a multiday trawl (OAL: 45 ft) having a trawl net mesh size of 40 mm. The specimens were weighing 95 and 90 kg having a length of 285 cm and 282 cm respectively. The GPS number (18^0 59' 44" N and 70^0 17' 55" E) collected from fishermen inferred that the specimen was collected from the waters off Mumbai from a depth of 95m. The species belongs to the family Dasyatidae under the order Rajiformes. The landing of small eye sting ray is very rare in Gujarat. The specimens were found to be landed with other ray species *Aetobatus narinari*.

Dasyatis microps **landed at Veraval fishing harbour**

(Reported by Swatipriyanka Sen Dash, Veraval RC)

Sex change observed in *Lago omanensis* from Mangrol, Gujarat

During the month of October, 2013, 60 specimens were collected from Mangrol fishing harbour, out of which one single specimen of length 51.5 cm and weight 456 gm was observed to have both ovary and clasper. Externally it was appeared to be a male due to the presence of clasper but, when dissected the uterus and ovary were clearly visible. The female reproductive organs were fully developed with a single functional ovary. But the claspers were soft, not calcified and smaller in length. The testis was not found out inside body cavity. Other male reproductive organs like Vas differentia and seminal vesicles were also found to be absent. The shark was a spent female.



Lago omanensis **with both sex**

(Reported by Swatipriyanka Sen Dash and Sangita A. Bharadiya, Veraval RC)

Stranding of three green turtles at Jhaleswar, Gujarat

On 15th October, 2013 three green turtles (*Chelonia mydas*) were found in dead condition at Jhaleswar, 8 km away from Veraval. The curved carapace length and weight of the turtles were 95 cm, 90 cm and 61 cm and 150 kg, 120 kg and 50 kg respectively. The turtles were stinking and lying unnoticed for 3 days at Jhaleswar. Jhaleswar is a gill net operated landing centre. But the turtles were not caught by the gill netters as there were no wounds in the dead body and they were quite a far of the landing centre. They might have washed with the current. Green turtles are categorized as "Endangered" by IUCN Red List (IUCN, 2013) and are included in Schedule I of the Indian Wildlife (Protection) Act, 1972 and trading of this reptile is strictly prohibited.

Dead *Chelonia mydas* at Jhaleswar

(Reported by J.P. Polara and M.S. Zala and Swatipriyanka Sen Dash, Veraval RC)

sunfish

Sunfish *Mola ramsayi* landed at Gangolli, Karnataka

The giant sunfish *Mola ramsayi* was landed by a trawler at Gangolli in the last week of September 2013. The fish weighing around 25 kg was accidentally caught in the trawl net and landed at Gangolli Fishing Harbour, Udupi District, Karnataka on 14th September 2013. It is a rare occurrence in the trawl catch.

(Reported by U.V.Arghekar, , Bhatkal Field Centre, CMFRI, Mangalore)

Fishing with light resulted bumper catch at Mangalore Fisheries Harbour

An enterprising Fisherman from Mangalore Fishing Harbour tried fishing with light and landed huge quantity of large sized snappers, carangids, and barracuda. Three 200w bulbs were lighted from onboard the vessel and the large meshed fast sinking purse seine net known locally as '*kotibale*' was operated off Mangalore at a depth of 60 m on 8th October 2013. The catch estimated to be 32 t consisted only of large sized fishes. The fish was transported to the landing centre by carrier boat (12t) and the rest (20t) by the mother vessel.

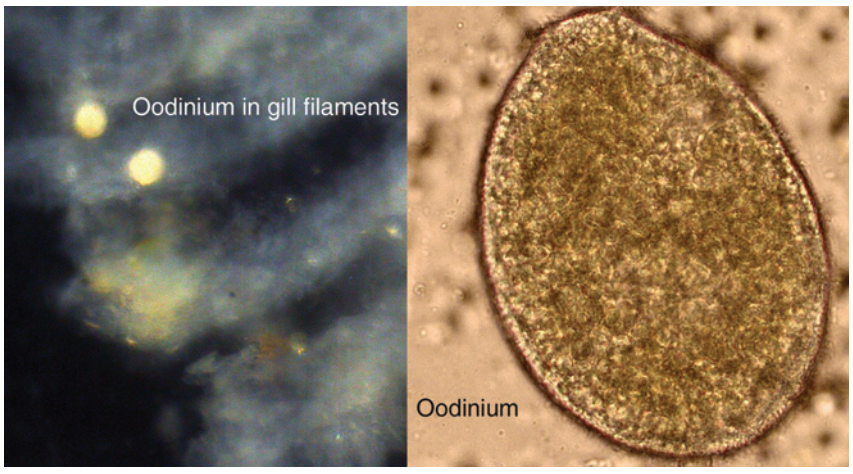
(Reported by Lingappa, Mangalore RC)

Bumper catch

Parasite infection (Dinoflagellate: *Amyloodinium* sp.) of juvenile silver pompano successfully treated at Vizhinjam RC

Pompano seeds (200 numbers in the size range of 50 to 55 mm length) stocked in the nursery tank of 5 tonne capacity, at the Vizhinjam Research Centre's hatchery started dying at the rate of 2, 9 and 6 per day from the onset of mortality. Fishes were gasping for air with rapid respiratory rate and were seen settling at the bottom of the tank. Microscopic observation of gills revealed heavy infestation by the dinoflagellate parasite *Amyloodinium* sp. The trophont stage of the parasite measured 60 to 70 microns. The parasites damaged the gills, caused swelling, necrosis and excessive mucous secretion. The infected pompano were transferred to treatment tank of 1000 litre capacity and treated with Chloroquine phosphate at 7 mg/litre for 3 days and the mortality declined to 6, 3 per day and stopped on the 3rd day. The treated fishes were transferred to new rearing tanks without further mortality. A few specimens were also treated with copper sulphate at the rate of 0.15 mg/litre. Though the treatment was found effective, the treatment with Chloroquine phosphate gave higher survival.

Reported by Vizhinjam RC)



Dinoflagellate parasite *Amyloodinium ocellatum* recorded from the gills of pompano

Sighting of Indo-Pacific humpback dolphin off Mangalore

A group (around 60 numbers) of the Indo-Pacific humpback dolphin, *Sousa chinensis plumbea* type was sighted off Mangalore (12° 52. 086' N, 74° 48. 254' E) at 6- 8 m depth. The Shoal was sighted on 18th November 2013 at 7.30 am and was moving along the coast from North of Panambur towards south of Nethravathi -Gurupur Estuary. Generally, the shoal of Indo-Pacific humpback dolphin tends to be small, containing fewer than 10 individuals. However, in this case the group was large (60 nos) and consisted of several subgroups. The subgroups moved with a short time gap and consisted of adults followed by young calf. Usually in the month of Oct-Feb, dolphins especially humpback dolphins are sighted near shore off Mangalore but in small groups of 6-7 nos. Another small group (7 nos) was sighted on 20.12.13 at 8.45 am.

They have a prominent dorsal hump and the dorsal fin sits atop this hump. Colouration is generally brownish-grey, with a lighter belly and spotting is limited to small areas of the tail stock. Colouration of adults is of light pink at the tip of the dorsal fin. The presence of seagulls and terns indicated the availability of fish in the coastal area. Hence, the dolphins could have come to this area for feeding on shoals of oil sardine and mackerel observed during the same time.

(Reported by Bindu Sulochanan and S. Lavanya Mangalore Research Centre of CMFRI)

Indo-Pacific humpback dolphin *Sousa chinensis* plumbea type sighted on 20.12.13

Sighting of Coastal Birds at Visakhapatnam

Thirty three species of coastal birds were identified and photographed from 30 surveys conducted in the coastal regions of Visakhapatnam. Asian Openbill-Stork (*Anastomus oscitans*) flock consisting of around 20 birds were sighted near Kancheru. Terns, Black tern flock consisting of more than 100 birds were observed at Bhimili and some 3-4 were also observed at Munagapakam. The fishes in catch corresponding to the tern sighting mainly comprised of oil sardine. Brown-headed Gull (*Larus brunnicephalus*) flock consisting of more than 200 birds visited Bhimili during October-December and they were observed coinciding with high catches of oil sardine.

(Reported by Visakhapatnam RC)

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International Research Project granted to CMFRI

CMFRI initiated the research project on "Global learning for local solutions: Reducing vulnerability of marine-dependent coastal communities" (GULLS) under the theme on 'Coastal Vulnerability' sanctioned under the International research project initiative by Belmont Forum and G8 Research Councils International Opportunities Fund. Of the 50 proposals submitted only seven proposals were successfully awarded by the reviewing agency-Natural Environment Research Council, United Kingdom. Director, CMFRI is the PI of the project, which comprises Dr. Shyam S. Salim as the Research co-ordinator, Dr. P. U. Zacharia, Dr. T.V. Sathianandhan, Dr. R. Narayanakumar, Dr. Prathibha Rohit and Dr. P. S. Swathilekshmi as Co-Principal investigators of the project.

Aggregations of Brown-headed Gull at Purakkad, Kerala - Sign of the mudbank fishery potential

During the survey on pelagic birds of Kerala coastal area, large aggregations of about 1200 numbers of Brown-headed gull *Chroicocephalus brunnicephalus* were sighted on 5.12.2013 at Purakkad, Alappuzha. The Heuglin's Gull *Larus heuglini* also observed along with Brown-headed Gulls. Nevertheless, only 120 brown headed gulls were observed off Kochi on the same day. These birds are migratory, regularly arrive here on October and depart before April. It mainly feeds on small fishes, polychaetes, fish wastes, crustaceans and insects. Mass of gulls usually accompanies trawlers for scavenging on discarded fish. Purakkad is an upwelling area and mudbank forms here during southwest monsoon period which greatly increases the productivity and provide abundant food for birds. The sediment texture along the coast also favours the foraging birds. The availability of food expedites mass migration of gulls in Purakkad than Kochi areas.

(Reported by R. Jeyabaskaran, Jishnu and V. Kripa. FEM Division, Kochi)

Brown-headed gull *Chroicocephalus brunnicephalus* (Jerdon, 1840)

Resumption of sea cage farming for the benefit of 'Sidi tribals with innovative all weather mooring system.

View of one of the deployed cage

The sea cage farm under the TSP has been re-established off Somnath coast with two additional units for the farming season 2013-14. This year two more tribal families will benefit from the programme thus making the total beneficiaries under the project to 110 members belonging to 22 households. Regarded as one of the largest commercial scale sea cage farm in India, it now comprises of 22 circular cages of 5m dia for multi-species farming and has already been stocked with lobster, grey mullet and six barred grouper. The farm tucked nearly half a kilometer from the seashore extends to an area of one kilometer with the average depth of the area being 9m. The major innovation in the farm design for the current year has been to prevent the loss of mooring system during the rough weather of monsoon and thereby enabling initiation of farming activities very early in the next crop season.

The moorings for 22 cages under the TSP and three units under the in-house project were deployed on 9th November, 2013 at the identified locations off Somnath coast opposite to the Coastal Police Station, Veraval using a dumb barge mounted with JCB. Members of the tribal community took the lead in preparing the moorings as well as deployment of the same with active support of fishermen community of Veraval, thereby building the capacity of the tribals as well as the fishermen in designing, fabrication and deployment of mooring system, a critical point in the sea cage farm establishment.

Loading of mooring blocks on Barge

Use of casted mooring blocks as anchor

As an improvement over the gabion box system of mooring where in the moorings had to be deployed every year as it was lost during rough sea conditions in monsoon, the casted mooring block with sufficient weight along with sturdy and freely rotating plastic buoys was used for facilitating an all weather mooring system. The gabion boxes were used due to its convenience for traditional deployment practice using canoes or boats for establishing farm with less number of units and in areas where other deployment means are not available. Large scale deployments essentially require barges or crane tugs in order to ensure timely deployment at a low cost. Though all-weather farming is not possible with the present sea cage technology in fully exposed areas like Veraval, a perennial mooring system would facilitate initiation of farming activities in the subsequent farming season by early September itself immediately after the monsoon thereby enhancing the culture period by 60 more days thus benefitting the tribal to get one additional crop of lobster and fin fishes.

A trapezoid block of nearly 3 ton weight provided with a GI hook was casted using standard casting materials at appropriate rates for use as anchor. Mooring chain end was passed through the hook on the mooring block made of 1" GI rod and made a reef knot before being welded back on the chain using shackles to prevent slippage. Plastic buoys with freely rotating hooks at both the ends were used for floatation of the moorings instead of ordinary plastic drums welded with GI belts which get dismantled from the chain or broken due to excessive pressure during monsoon.

(Reported by Mohammed Koya K., Vinay Kumar Vase, Gyanaranjan Dash, Sreenath K.R., Suresh Kumar Mojjada and H.M. Bhint, Veraval RC)

Fabrication of frame for the mooring block casting

Cast mooring block being water cured

Sea cage farming as a CSR activity of Tata power plant

Veraval RC conducts preliminary survey at Modhava village, Mandvi

Consequent to successful sea farming trials in the outfall channel of the Mundra Plant of the Tata Powers Ltd during the last season by CMFRI, the company has approached the Institute for technical guidance for establishing sea cage farms for the fishermen of the Modhava village situated close to the Power Plant at Mundra as an activity under their Corporate Social Responsibility (CSR) scheme implemented through the NGO Aga Khan Rural Support Programme (India) (AKRSPi).

The Modhava is a fishing village in Mandvi taluka of Kutch District comprising about 390 fishermen mainly engaged in subsistence type of fishing employing shore seine, cast net, gill nets and dolnets. Fishing is done in the inshore areas up to a depth of 20-30 fathoms. The Village is in close proximity to the Mundra plant of the Tata Powers Ltd. The fishing activity in the village mainly targets dry fish market in addition to the local fresh fish requirements. Expansion in fishing through introduction of large fishing crafts is constrained because of the shallowness of the harbour and limited berthing facilities. The high tidal amplitude leading to wide exposed shore makes beach landing of crafts difficult. Therefore, the fishing village has remained in the scenario of subsistence fishing for quite a long time. The Village Development Council (VDC) of Modhava has been on the look out for alternative livelihood options for the young fishermen of the village and means to enhance fish production leading to other forward linkages employing the villagers including women.

Thus, the Tata Powers Ltd, Mundra rightly thought of introducing sea farming as an avocation to the villagers and through the AKRSPi and VDC with technical support of the CMFRI would like to establish clusters of sea cages in the area for the benefit of the villagers as an activity under the Corporate Social Responsibility (CSR) of the Company.

Survey and sampling at Modhava by CMFRI

Fishermen from Modhava visit to sea cage farm, Veraval

Fishermen and members of the VDC of this village were facilitated a visit to the sea cage farm of CMFRI at Veraval by the Tata Powers for orientation and to inculcate interest on sea farming in them. Consequent to their conviction after their visit and interaction with the officials of CMFRI, the AKRSPi invited the scientists of the CMFRI to inspect the area and chalk out plan for establishing the sea cages. Thus, a preliminary survey at sea off Modhava was carried out on 16th November, 2013 to find out suitable sites for establishment of sea cage farm and an ideal site with logistic advantages and with desired water quality, depth, nature of bottom nearness to natural seed resources etc was found out and reported to the concerned for further action.

(Reported by Vinay Kumar Vase, K. Mohammed Koya and H.M. Bhint, Veraval RC)

Participatory cage farming at Mandapam sea

Around 6400 numbers of cobia fingerlings were stocked in a circular GI metal cage of 6 m dia and 3.5 mts depth floated at Mandapam sea during November, 2013 by the Cobia Aquaculture Association, Rameswaram under participatory farming with CMFRI.

Cage designed by cobia aquaculture association

Visakhapatnam RC launches cages at Barrackpore and Sagar Island, West Bengal

Under NFBSFARA project on Stock Characterisation, broodstock maintenance and seed production of Hilsa (*Tenualosa ilisha*) sites were surveyed based on different salinity locations and seed availability of hilsa. Barrackpore, and Sagar Island of West Bengal were selected as sites for launching the cages. Two 6 m. dia circular HDPE cages are launched at the respective places. Two 2 m. dia seed cages were fabricated for each site for onsite collection and stocking of hilsa seed. Location specific mooring systems were adopted at Barrackpore and Sagar Island, West Bengal, considering the lowest and highest tidal amplitude.

Hilsa cage launched at Barrackpore, west Bengal

Greasy grouper *Epinephelus tauvina* rearing in cage at Visakhapatnam

Greasy grouper fry produced by induced breeding and larval rearing at mariculture hatchery of RC of CMFRI, Visakhapatnam were stocked in hapa (2 mm mesh size) which was fixed in 6 mt. dia HDPE floating cage off Visakhapatnam coast to study the nursery rearing and grow out in cages. The fry were fed with chopped trash fish thrice daily at the rate of 10% biomass. After 2 months of nursery rearing the average length and weight has increased to (12 cm, 18 gm). The fishes were shifted to another hapa of 6 mm mesh size and fed with the similar ration. Now after 5 months of rearing the fishes attained average length of 23 cm and average weight of 210 gm.

Customised training in mariculture for Maldivian officials at CMFRI

Releasing the course manual

The four weeks "Customised training in mariculture for Maldivian Officials" commenced at CMFRI, Kochi on 18th November, 2013. The training was inaugurated by Mr. Jasimuddin Mohammad, Head, Regional Programmes Group, GIDD, Commonwealth Secretariat, London. Dr. A. Gopalakrishnan, Director, CMFRI presided over the meeting. Dr. G. Gopakumar, Head, Mariculture Division was the Guest of Honour. Dr. A.R.T. Arasu, Head, Fish culture division, CIBA, Chennai delivered felicitation address. On the occasion 'Course Manual' was released by Mr. Jasimuddin Mohammad. Fifteen participants nominated by the Ministry of Agriculture and Fisheries, Maldives participated in the programme. The trainees were from different backgrounds comprising researchers, students, entrepreneurs and aquaculturists. The funding was from GIDD, Commonwealth Secretariat, London. The overall objective of the training was to strengthen the capacity of fisheries sector in Maldives. The training was conducted in three phases at CMFRI Cochin and Mandapam. Resource persons from CMFRI, Central Institute of Fisheries Technology (CIFT), Cochin, Central Institute of Brackishwater Aquaculture (CIBA), Chennai and National Bureau of Fish Genetic Resources (NBFGR), Cochin had handled the sessions at Kochi and Mandapam on various aspects of mariculture. They also had institutional visit to CIFT, NBFGR unit Cochin and Matsyafed Net Factory at Cochin. A series of field visits to cage farms at Cochin and Mandapam, Commercial marine ornamental fish hatchery and freshwater ornamental fish farm, commercial molluscan shell factory *etc.* were also included in the programme.

The **first phase** of the training was at CMFRI headquarters at Cochin from 17-11-13 to 29-11-13. After registration of the trainees, there was a brief introduction on the institute activities and achievements in mariculture by Dr. A. Gopalakrishnan, Director, CMFRI. Before commencement of the formal training, a faculty member-trainee interface was conducted in the presence of Commonwealth representative to obtain a background information on mariculture activities at Maldives, the issues to be considered in mariculture growth and development, and the basic understanding of the trainees in mariculture activities around the world and their specific requirement. Overview on mariculture and coastal (brackish water) aquaculture was given by eminent scientists in the respective areas. There were theory, practical, demonstration and hands on training on various aspects in mariculture related activities. About 25 sessions on various aspects in mariculture were handled by experts during the first phase of training which included lectures, field visits, practical sessions etc. The visit to the Central Laboratory facility at headquarters has given exposure to the trainees on various analytical and sophisticated equipments used in basic and applied research in marine sciences. The trainees had the opportunity to visit the Biodiversity museum, and the Library at CMFRI which are of international repute. A visit to CIFT, Cochin has enlightened them with the opportunities in post harvest techniques in fisheries and processing. A visit to Matsyafed net factory has been an exposure to a variety

Inaugural address by Mr. Jasimuddin Mohammad

Trainees at cage culture site

Participants with the faculty

of netting materials and nets used in fisheries and aquaculture sector.

The **second phase** of training at Mandapam Regional Centre of CMFRI from 30th November to 7th December, 2013 was commenced by an introductory session presided over by Dr. G. Gopakumar, Scientist-in-Charge & Head in Charge, Mariculture division. Thereafter, hands on training was given in PIT tagging, anesthetization, cannulation of pompano, micro algal stock and intermediary culture, estimation of cell count, rotifer culture and *Artemia* nauplii production. The functioning of the Recirculation Aquaculture System (RAS) was explained to the participants. They were given hands on training in hormonal induction of cobia in RAS. Field visits included ornamental hatchery unit at Madurai, seaweed farming unit and shell craft industries at Rameswaram.

The **third phase** of training was held at CMFRI headquarters at Cochin from 9th to 14th December 2013. Trainees were enlightened on capture based aquaculture of lobsters and red snappers in cages, economic analyses of mariculture activities; trade related issues and aspects on sociological perspectives. Good practices to be followed in mariculture, importance of record keeping and ecosystem approaches in mariculture were also discussed. To have an understanding on basics of aquaculture genetics a session on it along with visit to the NBFGR Unit at Cochin was arranged.

The valedictory function on 13th December 2013 was presided over by Dr. V. Kripa, Head, FEMD. Dr. T. K. Srinivasagopal, Director, CIFT was the Chief Guest and the trainees were presented with the Course Certificate on that day.

Introductory speech by Dr. G. Gopakumar, SIC, Mandapam RC

Trainees visit to sea cage farm at Mandapam

Hands on experience in induction

Trainees at RAS facility

Workshop on 'Species Prioritization for Mariculture' at Mandapam RC

Dr. A. Gopalakrishnan, Director, CMFRI addressing the workshop

A two days' workshop on 'Species Prioritization for Mariculture' was organized at Mandapam Regional Centre on 4th and 5th November 2013. Dr.A.Gopalakrishnan, Director, CMFRI, presided and gave guidelines for identifying the species. Scientist from Mariculture Division of Mandapam Regional Centre, Karwar Research Centre, Madras Research Centre, Vizhinjam research Centre and Vishakhapatnam regional Centre participated and detailed deliberation was conducted to identify suitable species for mariculture. Director suggested in bringing out of fact sheet for individual species.

Training on Capture based Aquaculture at Mangalore RC

Participants with the faculty

The training on Capture based Aquaculture commenced on 2nd December 2013. The training was conducted for 42 participants from College of Fisheries, Mangalore, Dept. of Fisheries Karnataka and KFDC of Karnataka. The training comprised of lectures on mariculture in general and Capture based Aquaculture in particular and hands on experience in small scale cage making and field visit to cage culture sites in coastal Karnataka. The training concluded on 4th December 2013.

Field visit to cage sites by trainees

Cage making by trainees

Mussel farming training conducted at Kadalundi and Ratnagiri

Mussel farming training was conducted for 65 trainees at Kadalundi panchayat under the kudumba shree project on 16.11.13. The training was for the SHG's that was formed by the panchayat.

Training on edible oyster and green mussel farming was jointly organized by CMFRI, MPEDA and NETFISH at Ratnagiri on 13th December 2013 for 40 participants.

Training on Impact of the aggregating devices on cuttlefish fishery at Mangalore RC

The Mangalore RC organized a training programme on the 'Impact of the aggregating devices on cuttlefish fishery' under HRD funding from 5-7 December, 2013. The programme intended to create awareness on the impact of unscientific fishing practice of cuttlefish spawners, was attended by 15 fishery managers/ officials from Department of Fisheries Karnataka, College of Fisheries, MPEDA and CMFRI.

Trainees with the faculty

Training on 'Micro Algal Culture' at Tuticorin RC

Participants along with faculty members

Training on 'Micro Algal Culture and Water Quality Management in Aquaculture system' was organized at Tuticorin RC for 5 days during 9th to 13th December 2013. 14 participants from different parts of the country participated the programme. They were entrepreneurs, students and researchers from Tamil Nadu, Pondicherry and Lakshadweep. The training programme involves theoretical lectures and hands on training in micro algal culture techniques and water quality parameters in aquaculture systems and analysis.

Training on bivalve farming at Ratnagiri and Sindhudurg

In continuation with the bivalve survey carried out under the 'Sustainable bivalve mariculture' project in October 2013 and in accordance with the technical programme on horizontal spread of bivalve farming in Maharashtra, Goa and Karnataka, bivalve farming training was conducted for participants from the surrounding villages at Ratnagiri and Sindhudurg from 12 to 14 December 2013. The training covered theoretical and practical aspects of bivalve farming techniques such as site selection, seed collection, seeding method, culture methods etc.

Training on modern approaches in aquaculture at Headquarters

A training programme on "Modern Approaches in Aquaculture was held in ATIC Hall, CMFRI, Kochi from 18th October 2013 to 1st November 2013 for the 53 students from GRFTVHSS, Thevara and GVHSS, Narakkal.

Dr. R. Narayanakumar addressing the students

Winter school on "ICT oriented extension strategies for Responsible Fisheries Management"

Releasing the course manual by Dr. A Gopalakrishnan, Director

CMFRI organised the ICAR Funded Winter School for 21 days on 'ICT Oriented Strategic Extension for Responsible Fisheries Management' from 5th to 25th Nov, 2013. Dr. C. Ramachandran was the Course Director and Dr. R. Narayanakumar, Dr. Vipinkumar. V. P., Dr. B. Johnson, Dr. Swathilekshmi. P. S, Dr. Shyam.S. Salim and Dr. N. Aswathy were the Course Co-Directors of the winter school. There were 25 participants from various parts of the country representing different streams of specialization.

Adoption of Responsible fisheries management--a concept made more famous through the international instrument brought by the UN/FAO namely the Code of Conduct for Responsible Fisheries (CCRF) is widely agreed as a remedy for the ills of fisheries management like overfishing and noncompliance of regulations, which have been alleged as causes for the dramatic depletion of fish populations in the world's oceans. India, being a signatory to the Code is bound to honour it and the country has witnessed pioneering advances in the promotion of the code, thanks to the biological as well as social science research contributions from CMFRI.

The efforts to engender a scientifically informed fisheries management or governance regime are always challenged by the inherent uncertainty that characterizes the epistemology of fisheries science. The complexity of an otherwise resilient tropical marine ecosystem adds fuel to the fire. And on the Human dimension we have a plethora of challenges despite promising perspectives from Hardin to Ostrom.

It is here that we need to fully appreciate the multitude of challenges we face in a precautionary and participatory framework. We have the instruments /tool box . But the credo of responsible fisheries is yet to become part of the community ethos. What could be the reasons and how we can overcome the barriers? Can we resort to the scintillating opportunities thrown open by the new vistas in Information& Communication Technology (ICT) to address our specific problems? Each concerned stakeholder has a responsibility to be part of a collective process to not only decipher the answers but also translate them into pragmatic ameliorative strategies. The winter school aimed to provide a platform to share and address these concerns.

The pedagogy of the school riveted around three major thematic areas namely the Resource and Technology perspective, the Human dimension and the ICT perspective. For the benefit of the participants study tours and practical sessions on the application of ICTs were also conducted. A special practical orientation to the CMFRI technologies was undertaken in Mandapam RC. The school succeeded in impressing the participants on the varied facets of the marine fisheries knowledge base so far built in the country and the immense opportunities thrown open by the ICT

Participants with the faculty

Dr. V. D. Deshmukh, SIC, Mumbai RC addressing the participants through video conferencing

Visit to cage culture site at Mandapam

context to translate this knowledge into a praxis towards a responsible fisheries management regime.

The participants of the Winter school, numbering 25, were selected from research institutes, universities, and colleges across the country. The faculty of the winter school was from the Central Marine Fisheries Research Institute, Central Institute of Fisheries Technology, Center for Marine Living Resources and Ecology, Kerala Agricultural University, International Collective in Support of Fish workers, Kerala State Cooperative Federation for Fisheries Development Ltd, World Wide Fund for Nature and other institutes. The prominent guest lecturers included well known experts like Dr. John Kurien, Dr. E. Vivekanandan, Dr. C. Bhaskaran, Dr. V.N. Sanjeevan, Mr. V. Vivekanandan and Mr Sebastian Mathew. The school was inaugurated by Dr. V. Kripa, Director in Charge on 5 November 2013. The course manual consisting of 48 lectures and another manual consisting of supplementary reading materials were released by the school. Dr. A. Gopalakrishanan, Director CMFRI felicitated the participants and distributed certificates on the concluding day.

(C. Ramachandran and R. Narayanakumar, SEETT Division)

First meeting of the committee to develop National Marine Fisheries Management Code convened

The first meeting of the committee constituted for developing a National Marine Fisheries Management Code (MFMC) was convened on 30.12.2013 at headquarters at 10.00 am. The Chairman, Dr. K. Sunil Mohamed, PS & Head, MFD welcomed the members to the meeting and indicated that there is no specific guide or code for the country at present. Basing on the articles of FAO CCRF, the Chairman said that we should develop an India version of this code and give it to the policy makers. The target group is the policy makers and not the fishermen.

The Chairman stated that we will take all relevant articles and subsections of the FAO-CCRF and present in a tabulator form on HOW it is to be operationalized, by WHOM and WHAT are the standards developed for it. This could form guidance for the concerned ministries.

Hon'ble Minister of Fisheries Shri. Avertano Furtado inaugurates open sea cage farming at Goa

Shri. Avertano Furtado, Hon'ble Minister of Fisheries, Goa inaugurated open sea cage culture on 25.11.2013 at Talpona, Goa. Around 50 fishermen/ farmers attended the function. Later the minister released cobia seeds into the cages at Talpona and Polem.

(Reported by Karwar RC)

Shri. Avertano Furtado, Hon'ble Minister of Fisheries, Goa lighting the ceremonial lamp

Hon'ble Minister releases cobia seeds into a cage at Polem, Goa

Forthcoming Events

Seminar on Approaches to Aquatic aqua system sustainability (in Hindi) at Headquarters on 10th April, 2014

Name of the Programme	Name of the Co-ordinator	Place of Training	Proposed time of Training	Proposed Benficiaries
Taxonomy of commercially important crustaceans	Dr. S. Lakshmi Pillai	CMFRI	22nd to 24th January 2014	Students and Research Scholars

Sea cage farm established by Veraval RC attracts fisheries students and fish farmers across the country

Nearly 35 students of BFSc and Diploma in Fisheries Engineering from College of Fisheries, G. B. Pant university of Agriculture and Technology, Pantnagar and College of Fisheries, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli respectively along with the faculties visited the sea cage farm site at Veraval during November, 2013 as part of their all India tour programme. The students and faculty of both these colleges stated that the sea cage farm established by CMFRI under the TSP for the tribal benefit has been behind their choosing to visit Veraval and desired detailed sessions on the sea cage farming for benefit of the students. They were provided with hands on exposure on all aspects of sea cage farming technology developed by the CMFRI and got their ambiguities about sea farming cleared.

The sea cage farm at Veraval has already been a training cum demonstration unit for Gujarat and Maharashtra as many farmers from various parts of coastal Gujarat and north Maharashtra besides the technical staff of the Department of fisheries, students of colleges, members of the NGOs etc visited the farm.

(Reported by K. Mohammed Koya Sreenath K.R and H.M.Bhint, Veraval RC)

Dr. B. Meenakumari, DDG (Fy), ICAR visits Mandapam RC

Dr. B. Meenakumari, Deputy Director General (Fy.), ICAR, visited Mandapam RC on 1st and 2nd November 2013.

Dr. B. Meenakumari, DDG (Fy.), ICAR visiting the larviculture facility and visiting the Aquarium

Joint Secretary, DBT, Govt. of India visits Karwar RC

Shri Shreeshan Raghavan, Joint Secretary, Department of Biotechnology, Government of India, New Delhi, visited Karwar RC 7.12.2013. The joint secretary interacted with the SIC and the Scientists of the centre about the ongoing research activities. After visiting the laboratory at the centre, the Joint Secretary visited the marine farm and bountifully appreciated the efforts of the centre for improving the cage design and mooring technology. He lauded the centre for its success in widespread adoption of the open sea cage culture technology by the fishermen groups.

Shri Shreeshan Raghavan interacting with the staff members and visiting the marine cage farm

Senior Advisor, Norway Embassy at Karwar RC

Shri. Rajeev Koul, Senior Advisor, Norway Embassy visited the Karwar RC on 3.12.2013 along with Ms. Rekha Gupta, Market Advisor, Royal Norwegian Embassy, New Delhi, as a pre visit to the cage farming site to determine the logistical and practical needs in view of the forthcoming visit of the Norwegian team to Karwar on 8.1.2014.

Director visits Mandapam RC

Dr. A. Gopalakrishnan, Director, CMFRI, visited Mandapam RC on 4th to 6th November 2013.

Dr.A.Gopalakrishnan, Director, CMFRI inaugurating the newly constructed entrance to the main block and visiting the live feed culture

Dr. R. Ezekiel, National Coordinator (NAIP) visits CMFRI, Kochi

The National Coordinator of component-II NAIP schemes, Dr. R. Ezekiel visited the CMFRI during 12th to 15th November 2013. On 12th November 2013, he visited the shellfish value added production unit run by the Quilon Social Service Society (QSSS). The QSSS had adopted the oyster processing technologies developed under the NAIP scheme for processing Yellow foot clam (*Paphia malabarica*) in Ashtamudi Lake. During his visit, he was apprised of activities and progress of the unit by Dr. K. Sunil Mohamed, Head, Molluscan Fishery Division. During 12-13th November 2013, he visited the Lakshadweep for investigating the progress of the value chain project on oceanic tuna. On 15th November 2013, he evaluated the on-going activities of the three NAIP projects in which CMFRI is the lead centre.

Dr. R. Ezekiel, National Coordinator (NAIP) viewing the processing unit

Dr. Kirsten Benkendorff, Southern Cross University, Lismore,Australia visits CMFRI

Dr. Kirsten Benkendorff, Southern Cross University, Lismore, Australia, to whom the MBTD of CMFRI initiated collaborative research efforts through an Indo Australian workshop under DBT Fund, visited CMFRI during 15-20th December 2013. During her visit she gave two seminars, one on "Marine Bioprospecting and medicines from molluscs on 20th December 2013 and "*Dicathais orbita* as a model for natural product research and nutraceutical development"

Mussel farmer adopted by Mangalore RC of CMFRI receives Zilla Rajyostsava Award

The *Zilla Rajyotsava Prashasti*, 2013 awardees with Shri. Vinaya Kumar Sorake, Hon'ble Minister for Urban development and Udupi district in-Charge and Shri Promodh Madhwaraj, MLA

Shri. Shankar Kundar, the mussel farmer from Kodikanyan, Udupi District of Karnataka was conferred with "*Zilla Rajyotsava Prashasti, 2013*" under the category "*Agriculture*" for adopting and practicing scientific mussel farming in Karnataka. This progressive farmer started mussel farming in estuarine areas of Swarna-Sita estuary under the guidance of CMFRI, R.C. Mangalore. He is one of the successful farmers in the State for producing farm-grown mussels since 2008. As a promoter of eco-friendly aquaculture practices, he is actively involved in educating other farmers on the advantages of practicing bivalve farming in district. Shri Shankar was conferred with the prestigious award among 17 personalities from the fields of Science, Agriculture, Information Technology, Medicine, Education, Literature, Dance, Theatre, Journalism, Sports and Music. The award was presented on the occasion of the birth of Karnataka State on 1-11-2013 by Shri. Vinaya Kumar Sorake, Hon'ble Minister for Urban development and Udupi district in-Charge and Shri Promod Madhwaraj, MLA.

Mumbai RC participates in ICAR Fish Exhibition

Maharashtra State Government organized an Agriculture and fisheries technology mela on 27th December 2013 at Saundad in Gondia District. Honourable Union Agriculture and Food Processing Industries Minister Shri Sharad Pawar, inaugurated Fish exhibition put up by ICAR institutes viz. CMFRI, Cochin; CIFE, Mumbai; CIFRI, Kolkata; CIFA, Bhubaneshwar; CIFT, Cochin. CMFRI stall was represented by Mumbai Research Centre and demonstrated m-KRISHI Fisheries mobile service and open sea cage farming technology to the fishers. In his address, Hon. Union Minister mentioned the role of ICAR institutes in technological innovations for fishers & farmers and insisted for their adoption by stakeholders. Hon.Minister visited CMFRI stall at the exhibition were appraised of research activities for promoting m-KRISHI mobile service and open sea cage farming technology in India. Hon. Union Minister for Heavy Industries and Public enterprises Shri Praful Patel and five Members of the State Legislative Assembly were also present at inauguration of the exhibition. Approximately 40,000 fishers and farmers were enlightened with latest fisheries technologies developed by ICAR institutes.

Hon. Union Minister Shri Sharad Pawar looking open sea cage model at CMFRI stall

CMFRI Stall at Newman's college, Thodupuzha

Headquarters participates the following exhibitions

- Exhibition in connection with International Union of Conservation of Nature during the period from 28th to 31st October, 2013 held at Taj Residency, Marine Drive, Kochi.
- Exhibition in connection with Public Information Campaign Karshikamela during 29th to 31st October, 2013 held at Palakkad.
- Exhibition in connection with Karshikamela during 26th December 2013 to 4th January, 2014 held at Newman's College, Thodupuzha.

Calicut RC participates various exhibitions

- Participated at SYSMSAC-VII exhibition at Madikeri, Karnataka for three days (27th 28th & 29th November 2013).
- Participated at Government Arts and Science College, Calicut - SUVARNA 2013 the Art-Science - Heritage Exhibition for three days (24th 25th & 26th October 2013).
- Participated at Thiruvangoor Higher Secondary School, Thiruvangoor, Calicut - Shasthrolthsavam - 2013 Art and Science Exhibition two days (10th and 11th October 2013).

Tuticorin RC participates the exhibition on Aquatic wild life of the sea

Tuticorin Research Centre of CMFRI participated in the exhibition on the "Aquatic Wild Life of the Sea" on the occasion of World Wild Life Week Celebration (2nd to 8th October, 2013) organized by District Administration and Forest Department, Tirunelveli, Tamilnadu.

Dr. B. Meenakumari, DDG (Fy) visits KVK Narakkal Campus

Dr. B. Meenakumari,DDG(Fy) interacting with students at KVK campus-Narakkal

Dr. B. Meenakumari, Deputy Director General (Fy), ICAR visited KVK campus Narakkal on 29-10-2013 along with Dr. A. Gopalakrishnan, Director, Central Marine Fisheries Research Institute (CMFRI). She interacted with the VHSE Aquaculture students from Govt. Vocational higher Secondary School, Narakkal who were undergoing a training programme at the campus. DDG (Fy) briefed them on the opportunities in higher education in fisheries. The students were excited to see DDG who came on a surprise visit to the campus. Later on DDG (Fy) held a meeting with KVK officials.

One day training conducted at Narakkal campus for extension functionaries on Prospects and recent trends in Aquaculture

The fisheries department trainees at Narakkal campus

One day field training on "Prospects and recent trends in Aquaculture" was conducted at KVK Narakkal campus for Sub Inspectors of Fisheries from Dept. of fisheries, Govt. of Kerala. The trainees were deputed from NIFAM- Kerala fisheries department training centre, Kadungallur. The programme was conducted on 23rd November 2013.

Mechanized Paddy weeder demonstrated

KVK demonstrated mechanized Paddy weeder popularly known as Power weeder on 11th October 2013 in a 3 acre mookkumkuzhy padasekharam at Oonjappara near Kothamangalam. Kothamangalam block panchayath president Shri. K I Jacob inaugurated the programme in the presence of Keerampara grama panchayath president Smt. Lissy Valsan. The demonstration was conducted by the members of Pulari Thozhil Sena of Kodumbu grama Panchayath, Palakkad. There was an interactive session between this thozhil sena members and local farmers which gave the local farmers confidence on mechanized paddy farming.

Block-panchayath president Shri.K.I.Jacob inaugurating the Paddy weeder demo programme

New product launched

Muvattupuzha M.L.A, Shri.Joseph Vazhakkan released KVK's organic fertilizer cum insect repellent formulation- Organo excel on 2nd December 2013 at Muvattupuzha Karshikotsav. The formulation contains Neem cake and Ground nut cake. Organo Excel is a rich source of NPK, improves soil aeration & water holding capacity, accelerates activity of beneficial micro organisms, enhances root development, accelerates growth in plants. In addition it possesses insect repellent action also.

Demonstration of Paddy combine harvester

KVK demonstrated Paddy combine harvester 2013 December in a 3 acre mookkumkuzhy padasekharam at Oonjappara near Kothamangalam. Kothamangalam block panchayath president Shri. K. I. Jacob inaugurated the programme in the presence of Keerampara grama panchayath president Smt. Lissy Valsan.

Block-panchayath president Shri. K. I. Jacob inaugurating the paddy combine harvester

- **Dr. A. Gopalakrishnan,** Director
  Attended the inaugural and valedictory function of the BOBLME/FAO/NBFGR International Harmonization Workshop on Indian Mackerel Genetics at NBFGR Kochi Unit during 20-27 August 2013 and also served as faculty member in the said workshop.

  Attended Oyster Farmer's Award ceremony at Moothakunnam on 27th September 2013.

  Attended the TSP meeting at Bali, Sunderbans and also attended the Hilsa meeting at Gadkhali, Kolkata, chaired by the Director General, ICAR on 2nd & 3rd October, 2013.

  Attended the high level meeting of ICAR officials and Garware leadership convened by the Director General, ICAR at Garware Wall Ropes Unit at Wai near Pune on 7th October, 2013.

  Attended the second meeting of Scientific Panel on Fish and Fisheries Products at Food Safety and Standard Authority of India, New Delhi on 15th October, 2013.

  Reviewed the research and other activities of the Visakhapatnam Regional Centre and separate discussion was held with the field staff on damages caused to the marine fisheries sector by the phailin cyclone on 24th and 25th October, 2013.

  Attended the second meeting of Expert Committee for Comprehensive Review of Deep Sea Fishing Policy and Guidelines at CIBA, Chennai on 31st October, 2013.

  Chaired the Workshop on 'Species Prioritization' to identify suitable species for mariculture technology development held at Mandapam Regional Centre of CMFRI on 4th & 5th November, 2013.

  Attended the third meeting of Expert Committee for Comprehensive Review of Deep sea Fishing Policy and Guidelines at Krishi Bhavan, New Delhi on 21st and 22nd November, 2013.

  Attended the Consultative meeting on Fisheries Development in the State of West Bengal, Research, Extension & Development Support by the ICAR Fisheries Research Institutes at Kolkata on 23rd November, 2013.

  Participated in the Interactive Workshop on Administrative and Financial matters for the ICAR Institutes located in Southern region at NAARM, Hyderabad on 9th & 10th December, 2013.

- **Dr. (Mrs.) V. Kripa,** Head, FEMD
  High-level meeting to discuss the State Action Plan for Climate Change and identify suitable projects and specific agencies for implementing climate change adaptation projects at NABARD Regional Office, Thiruvananthapuram on 28.11.2013.

  Clam Council meeting with District Collector at the Collectorate, Kollam on 28.11.2013.

Foreign deputation

- **Dr. K.S. Mohamed at Portugal**

  Dr. K. S. Mohamed, Head, MFD attended the Developing World Working Group (DWWG) meeting of Marine Stewardship Council (MSC) at Lisbon, Portugal on 08-12-13 to 09-12-13

  Attended the 22nd Technical Advisory Board (TAB) meeting of Marine Stewardship Council (MSC) at Lisbon, Portugal from 10-12-13 to 12-12-13

- **Dr. P. Vijayagopal at Singapore**

  Dr. P. Vijayagopal, Principal Scientist, Marine Biotechnology Division successfully taken up DBT Fellowship (Department of Biotechnology - Cutting Edge Research Enhancement and Training Award (DBT-CREST Award 2011-12) during December 2012 - December 2013 at TEMASEK Polytechnic, Singapore. Apart from attending the international conference, The Aquaculture Roundtable Series (TARS) 2013 and the trade show Aqauarama 2013, he worked on a collaborative research project on the nutrition of the ornamental fish, honey gourami.

Dr. P. Vijayagopal at TARS (2013), Singapore

- **Dr. A. P. Dineshbabu at Thailand**

Participants of the workshop with Dr. A.P. Dineshbabu

A. P. Dineshbabu , Principal Scientist attended the workshop on 'Tropical Trawl Fishery Management' conducted by Asia Pacific Fisheries Commission and FAO, for the regional guidance for the management of tropical trawl fisheries in the Asian region during 30th September- 4th October 2013, at Phuket, Thailand.

- **Dr. E. M. Abdussamad at Oman**

  Dr E.M. Abdussamad, Principal Scientist attended international workshop on ***"Fishes Otolith-based ageing and stock assessment 2013"*** at Muscat, Oman during 23-31-October, 2013. The workshop was organized by the Fisheries Support Unit (FSU) of "Indian Ocean Rim Association for Regional Co-operation (IOR-ARc)" at Marine science and Fisheries Centre (MSFC).


Participants of the workshop with Dr. E. M. Abdussamad

IMC meeting at CIFT Kochi on 22.11.2013.

- **Dr. K.S. Mohamed,** Head, MFD Attended the Ashtamudi Clam Fisheries Governing Council (ACFGC) meeting on 01.10.2013 and 29.11.2013 at Kollam.

  Attended and presented a paper at the Regional Symposium on 'Ecosystem approaches to the Management and Conservation of Fisheries and Marine Biodiversity in the Asia Region from 25-30 October 2013.

  Served as a member, UPSC interview Board for selection of DG, FSI on 26.11.2013 at New Delhi.

- **Dr. K. K. Vijayan,** Head, MBTD attended the training programme on "Pre-RMP programme" held at NAARM, Hyderabad during 26 November to 7th December 2013.

- **Dr. P. U. Zacharia, Dr. V. Kripa, Dr. K. K. Vijayan, Dr. T. V. Sathianandan, Dr. A. P. Dinesh Babu, Dr. S. J. Kizhakudan, Dr. Sujitha Thomas, Dr. P. S. Asha, Dr. Shyam S. Salim, Dr. Vipin Kumar V. P., Dr. N. Aswathy, Dr. T. M. Najmudeen, Dr. Rekha J. Nair, Dr. Sandhya Sukumaran, Dr. S. Ghosh** and **Shri. Sreenath, K. R.** participated and presented papers at the Second International Conference on Ecosystem Conservation, Climate change and sustainable development, organized by Department of Aquatic Biology and Fisheries, University of Kerala at Thiruvanathapuram, Kerala, India during 3-5 October 2013.

- **Dr. R. Narayanakumar**, Head, SEETTD attended the Mid-Term Evaluation Performance of RFD of the Fisheries Research Institute held at Fisheries Division, ICAR, New Delhi, Nov. 8, 2013.

  Attended the International Training Programme on Fisheries Management, organized by the Ministry of External Affairs and Kochi University of Fisheries and Ocean Studies and took class on Economics of fishing methods and fisheries management on 15.12.2013.

- **Dr. K. K. Philipose,** Principal Scientist and SIC and **Dr. T. Senthil Murugun** participated in the National symposium on "Taxonomy and Biogeography" organized by Department of Studies in Marine Biology, Karnataka University P.G.Centre, Karwar on 7th December 2013.

- **Dr. K. Vinod**, Principal Scientist and Scientist in Charge attended the Pre qualification Bid Evaluation meeting held at O/o Tamil Nadu Urban Infrastructure Financial Service (TNUIFSL), T.Nagar, Chennai on 17.12.2013 for evaluating bid and project reports in setting up of World Class Oceanarium at Mammallapuram under PPP mode through TNTDC and Dept. of Fisheries, Tamil Nadu.

- **Dr. Prathibha Rohit** and **Dr. Dineshbabu A. P.** Principal Scientists attended the International Regional Workshop on Ecosystem approaches to the management and conservation of fisheries and marine biodiversity in the Asian region organized by Mangroves for the Future from 27-30 October 2013, The Gateway Hotel, Kochi.

- **Dr. Prathibha Rohit,** Principal Scientist attended the second and third meetings of the expert Committee for Comprehensive Review of Deep sea fishing policy and guidelines, on 31 October 2013 at Chennai; 22 November 2013 at Krishi Bhavan, New Delhi.

  Participated in the meeting of experts from fishery and marine biology and present inputs for the proposed web based atlas- Karnataka biodiversity atlas on 6th December 2013 at Malleshwaram, Bangalore.

- **Dr. A. P. Dineshbabu,** Principal Scientist attended National symposium on "Taxonomy and Biogeography" conducted by Department of studies in Marine Biology, Karnataka University at Karwar on 7th December, 2013 and presented the lead Lecture.

- **Dr. E.M. Abdussamad,** Principal Scientist attended "*NAIP-World Bank-ICAR-ISI Cross-Learning Evaluation Workshop*" organized by Sampling and Official Statistics Unit (SOSU), ISI, Kolkata and Agricultural and Ecological Research Unit, ISI, Kolkata during 03-04 December, 2013.

- **Dr. P. S. Asha,** Principal Scientist participated as a resource person and delivered a lecture in Tamil in the ICSF-BOBLME training programme on enhancing capacities of fishing communities for resource management at Akkalmadam and Ramnad of Ramanathapuram District, Tamil Nadu during 23-26 October 2013

- **Dr. M. K. Anil,** Principal Scientist attended MDP Workshop on Priority setting, Monitoring and Evaluation (PME) of Agricultural Research Projects from 19th to 23rd November 2013 at NAARM, Hyderabad.

- **Dr. Joe K. Kizhakudan**, Senior Scientist attended interactive meeting with members of the Irula tribe in Oyyalikuppam (Kancheepuram district), at Oyyalikuppam on 29/11/13.

  Delivered a talk on "Strides in Mariculture Development" at the Fisheries Training College, Tamil Nadu Fisheries Department on 16/12/13.

- **Dr. Ganga. U,** Senior Scientist, participated in training program on "Integrated Scientific Project Management for Women scientists / technologists" at Centre for Organisation Development (COD), Hyderabad during 18-22 November, 2013.

- **Dr. C. Ramachandran,** Senior Scientist attended a meeting on 'Deep Sea Fishing Policies at CIBA, Chennai on 31st October, 2013.

- **Dr. P. S. Swathi Lekshmi,** Senior Scientist, attended the short course on communicating science for the main stream media at NAARM, Hyderabad from 17-12-2013 to 26-12-2013.

- **Dr. S. Jasmine,** Senior Scientist attended the training programme on 'Integrated Scientific Project Management for Women Scientists/Technologists' from 18th to 22nd November 2013 at the Centre for Organization Development, Hyderabad.

- **Dr. R. Jeyabaskaran,** Sr. Scientist attended and presented a paper on the topic 'Marine mammals and fisheries interactions in Indian seas' for the Regional Symposium on 'Ecosystem approaches to the Management and Conservation of Fisheries and Marine Biodiversity in the Asia Region from 25-30 October 2013.

  Delivered a lecture on 'Marine Environmental Conservation' at V.O. Chidambaram College, Palayamkottai Road, Thoothukudi, Tamilnadu - 628 008 on 10th October 2013.

- **Dr. Kajal Chakraborty,** Senior scientist participated and presented a paper at the National Seminar on Therapeutics of Marine Bioactive Compounds on 9th and 10th December 2013 at Gandhigram Rural Institute, Gandhigram, Tamil Nadu.

  Participated in the Workshop on "Valuation and Pricing of Agricultural Technologies" organized by Agrinnovate India Limited (AgIn) in collaboration with IP&TM Unit of ICAR, New Delhi on 26.12.2013 and presented the CMFRI component on "Poultry Breeds, Fish strains and Fish gadgets".

- **Dr. Rekha J. Nair,** Senior Scientist attended a Training programme on Integrated Scientific Project Management for Women Scientists – Sponsored by Department of Science and Technology (DST) from November 18-22,2013 at Hyderabad.

- **Dr. Rajesh K.,** Senior Scientist attended five days MDP Workshop on PME of Agricultural Research Projects at NAARM, Rajendranagar, Hyderabad during November 19-23.

- **Dr. V. Venkatesan,** Scientist participated in the NAIP Preparatory Cross Learning Evaluation Workshop held at ISI, Kolkata during 3-4 December 2013.

- **Dr. B. Johnson,** Scientist participated as a resource person and delivered two lectures in ICSF-BOBLME training programme to fishing communities at Pamban and Ramanathapuram during 23 to 26 October 2013 organized by ICSF, Chennai.

Participated in the workshop on Fisheries and Human Well Being at Gulf of Mannar on 30th September 2013 at National Centre for Sustainable Coastal Management, Chennai.

- **Shri R. Saravanan,** Scientist participated in the Refresher course on Integrated Coastal Management held at College of Fisheries, Mangalore during 28th-31st October 2013.
- **Dr. Amir Kumar Samal,** Scientist participated in Winter School on "Advances in molecular and serological tools in fish diseases diagnosis'" at Central Institute of Freshwater Aquaculture, Bhubaneswar from 9th-21st November 2013.
- **Shri. L. Ranjith,** Scientist attended AusAID Ecotoxicology Training Workshop on 2nd to 6th December, 2013 under Commonwealth Scientific and Industrial Research Organisation (CSIRO) - Indian Institute of Toxicology Research (IITR) - National Bureau of Fish Genetic Resources (NBFGR) project on "Safe Water for the Future" held at NBFGR, Lucknow, India.
- **Shri. P. Chidambaram,** Senior Technical Officer (Library) attended short training course on Knowledge Management at ISTM, Delhi from 7th to 9th October 2013.

Won best paper award

at the International conference on ecosystem conservation, climate change and sustainable development, 3-5 October 2013, Thiruvanathapuram

- **Zacharia P. U., Rekha J. Nair, Somy Kuriakose, J. Jaysankar, A. P. Dinesbabu, Sujitha Thomas, S. J. Kizhakudan, T. M. Najmudeen, Anulekshmi Chellapapn** and **Mohamed Koya, K.** Distributional shift of pelagics, Indian Oil sardine and Indian Mackerel towards northern Indian Ocean-a climate change induced scenario? '
- **Vipinkumar V. P., R. Narayanakumar, C. Ramachandran, Shyam S. Salim, P. S. Swathilekshmi**, and **B. Johnson** 'An Information communication & Technology Module on Impact of Microfinance on Coastal Indebtedness in the theme on ICT'

Official Language Implementation

Spoken Hindi Class at Headquarters

A programme on Spoken Hindi was organized at Headquarters from 11 to 13th December 2013. The inaugural session was held on 11.12.2013 in the Conference Hall of the Institute. Dr. A.Gopalakrishnan, Director presided over the function. Shri Rakesh Kumar, Chief Administrative Officer welcomed the gathering. Shri Kanwar Bhan Chawla, Chief Manager, Union Bank of India, Cochin was the expert for conducting class on Spoken Hindi. Total 28 Officers including Scientists, Administrative and Technical Officers attended the class.

Address by the Chief Guest

Inspection of Official Language activities of ICAR Institutes/Directorate

Smt. Sheela P.J., Dy. Director (OL) and Smt. E.K. Uma, Asst. Chief Technical Officer inspected the Official Language Implementation activities of Directorate of Cashew Research, Puthur on 24-10-2013, Indian Institute of Spices Research, Kozhikode on 7-11-2013 and National Banana Research Centre, Thiruchirapally, Tamil Nadu on 5-12-2013. They also inspected the Official Language activities of CMFRI Research Centres at Calicut and Mangalore and Report submitted to ICAR.

Hindi workshop at Madras RC

In order to promote the use of Hindi in official work, a Hindi workshop entitled **'Please introduce yourself'** - an interactive session was conducted at Madras Research Centre of CMFRI on 3rd December 2013. Dr. K. Vijayakumaran, Senior Scientist of the Centre conducted the interactive workshop. Total 35 officers and staff members of the Centre took part in the workshop.

Hindi week celebration at Veraval RC

The Hindi week celebration for the year 2013 was organized at Veraval RC from 19th to 25th September, 2013. The inauguration of the programme was done by Shri Mohammed Koya , S.I.C, Veraval R.C. Later Mrs. Swatipriyanka Sen Dash, Scientist and Hindi officer narrated the importance of the Hindi Saptah Celebration on the eve of the occasion. All staff members attended various competitions like "Shrut lekhan, Nibandh lekhan, Chitra kala, Samanya gyan, Hindi bhasa par Vyakhyan, Geet Sangeet, and Samuh gan. During valedictory ceremony, prizes were distributed to the winners by Shri. Mohammed Koya, SIC. The scientists and staff of Veraval centre of CIFT were invited for attending the programme.

Winners receiving prizes from
Shri Mohammed Koya, SIC, Veraval RC

We salute the seniors on their retirement

Dr. N. Ramachandran
Principal Scientist
31.12.2013 Vizhinjam RC

Shri S.K. Gurusamy
T-1-3 (Motor Driver)
31.10.2013 Tuticorin

Shri Mathew Joseph
Sr. Technical Officer
30.11.2013 Kochi

Shri S. Subramani
Sr.Technical Officer
30.11.2013 Madras RC

Shri Sailada Satya Rao
Sr. Technical Officer
30.11.2013 Visakhapatnam RC

Shri K. Chandran
Technical Officer
30.11.2013 Calicut RC

Shri R. Ramachandran Nair
Tech. Officer (Motor Driver)
31.12.2013 Kochi

Shri M.R. Wadadekar
Asst. Adm. Officer
30.11.2013 Mumbai RC

Shri J.N. Jambudiya
Assistant
30.11.2013 Veraval RC

Smt. D. Lalithambika Amma
Upper Division Clerk
30.11.2013 Kochi

Shri P. Krishna Rao
Upper Division Clerk
31.12.2013 Visakhapatnam RC

Shri D. Pakkiri
Skilled Support Staff
31.10.2013 Madras RC

Shri V. Viswanathan
Skilled Support Staff
31.10.2013 Vizhinjam

Shri K. Sankaran
Skilled Support Staff
31.12.2013 Calicut RC

Shri M.P Chandrasekaran
Skilled Support Staff
31.12.2013 Madras RC

ASSUMPTION OF CHARGES

Dr. P. K. Asokan, Principal Scientist, Calicut RC of CMFRI has assumed the charges of the Scientist-in-Charge, Calicut Research Centre of CMFRI on 07.10.2013.

PROMOTIONS

Names & Designation	Promoted as	w.e.f	Center
1. Shri V. C. Subhash, Assistant, CMFRI Hqrs.	Assistant Administrative Officer	03.12.2013	Mangalore RC

TRANSFERS

Name & Designation	From	To	w.e.f
1. Dr. P. Kaladharan, Principal Scientist	Calicut RC	CMFRI Hqrs.	07.10.2013
2. Dr. K. Vijayakumaran, Senior Scientist	Mangalore RC (on deputation as DG,FSI, Mumbai)	Madras RC	09.10.2013
3. Shri Vanvi Mansukhlal Madhavji, Assistant	Mumbai RC	Veraval RC	21.10.2013
4. Shri M. Radhakrishnan, Assistant Finance & Accounts Officer	Mandapam RC	CMFRI Hqrs.	02.12.2013
5. Shri S. Selvanidhi, Senior Technician	Cuddalore FC	Madras RC	16.12.2013
6. Shri T. P. Renilkumar, Skilled Support Staff	Calicut RC	Karwar RC	16.12.2013

PROMOTION AND TRANSFER

Names & Designation	From	To	w.e.f
1. Shri M. Radhakrishnan, Assistant Finance & Accounts Officer	CMFRI Hqrs.	IISR, Calicut as Finance & Accounts Officer	07.12.2013

MEETINGS

Fourth meeting of the 12th Institute Joint Staff Council of CMFRI held on 16th November 2013 at CMFRI Hqrs. Cochin.

Ph.D. AWARDED

1. Mrs. S. Veena, Senior Technical Asst., Visakhapatnam RC was awarded Ph.D during November 2013 from Faculty of Biosciences, Mangalore University. The topic was 'Studies on the impact of fisheries on the biodiversity of marine fish resources of Karnataka Coast".
2. Vikas P. A., SMS (Fisheries) of KVK awarded Ph.D degree for his thesis entitled "Genetic and Biochemical evaluation of Brine shrimp, Artemia from the hypersaline habitats of Indian subcontinent" under the guidance of Dr. P.C. Thomas, Principal Scientist and SIC, HRD Cell from Mangalore University, Karnataka.

Obituary

With profound sorrow
CMFRI family pay homage to
our beloved colleague

Shri A. Anukumar
Skilled Support Staff
Vizhinjam RC 31.10.2013

Seabird aggregations at Purrakad, Kerala
A visual treat for environmentalists

see page 9

Photo by R. Jeyabaskaran

केंद्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान
CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
के स मा अनु सं
CMFRI

cadalmin
CMFRI Newsletter

Cadalmin, the CMFRI Newsletter is a quarterly publication of the Central Marine Fisheries Research institute, Cochin. The publication gives an insight into the major events of the quarter, besides highlighting the salient findings in the research front and dissemination of technological know-how to the farming community.